Inclusive diffraction --towards final plots?

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From discussion with Raju:

A “natural” rate of diffraction would be 1/9~11%,
which is close to what was observed at HERA (~15%).
This comes from mere numerical considerations,
a colour octet+1 exchange (or $1/N_c^2$).

With this argument, there is no reason to believe that
the diffractive rate in *e*A would be any different from *ep*.

It is a prediction from CGC that the diffractive rate in *e*A > *ep*
(bSat is CGC)

This is seen in doube ratios R:

When both A and *p* are at the BDL, ***R=1*** (as “natural” HERA case)

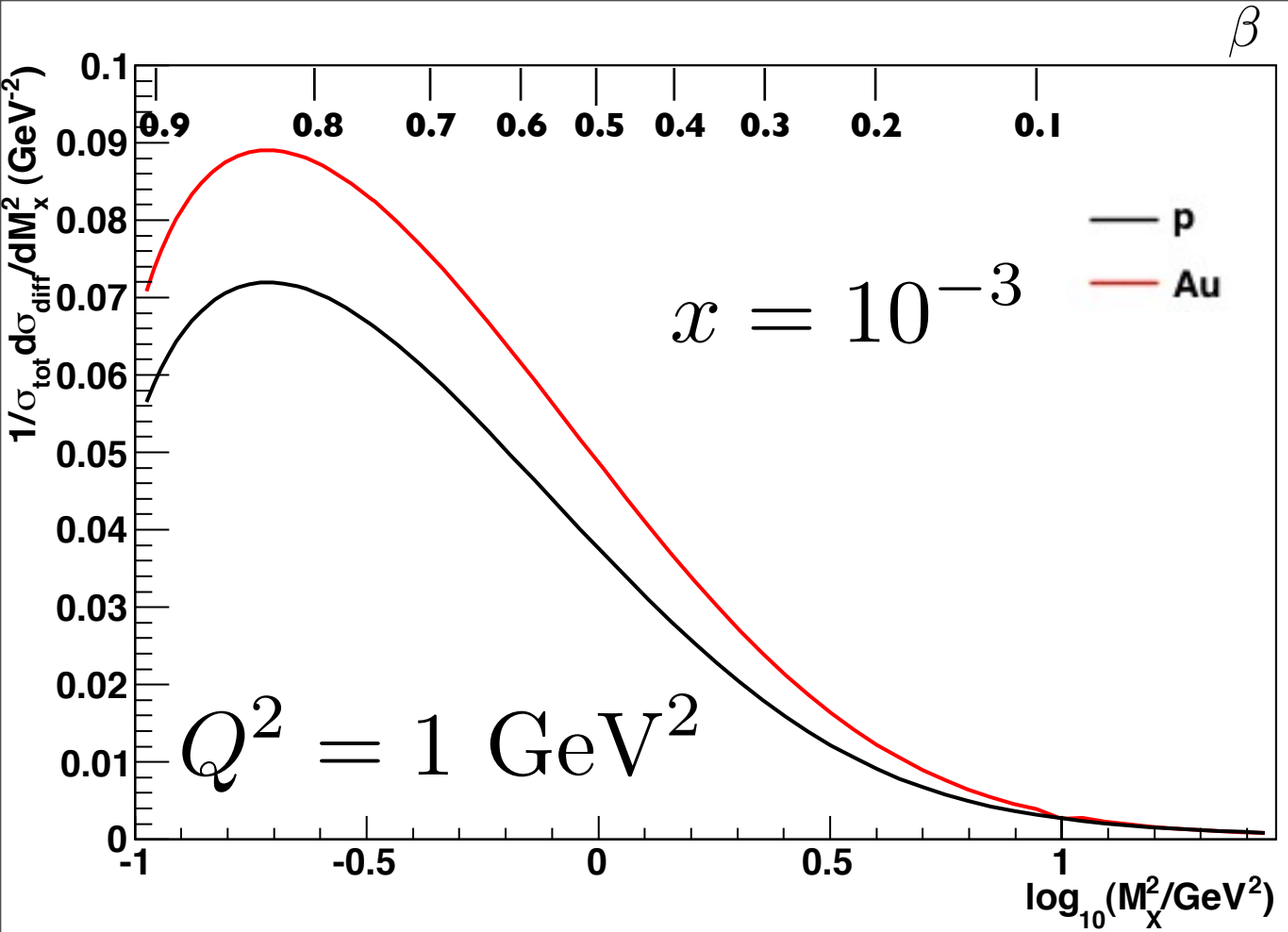
Else, *R>1*.

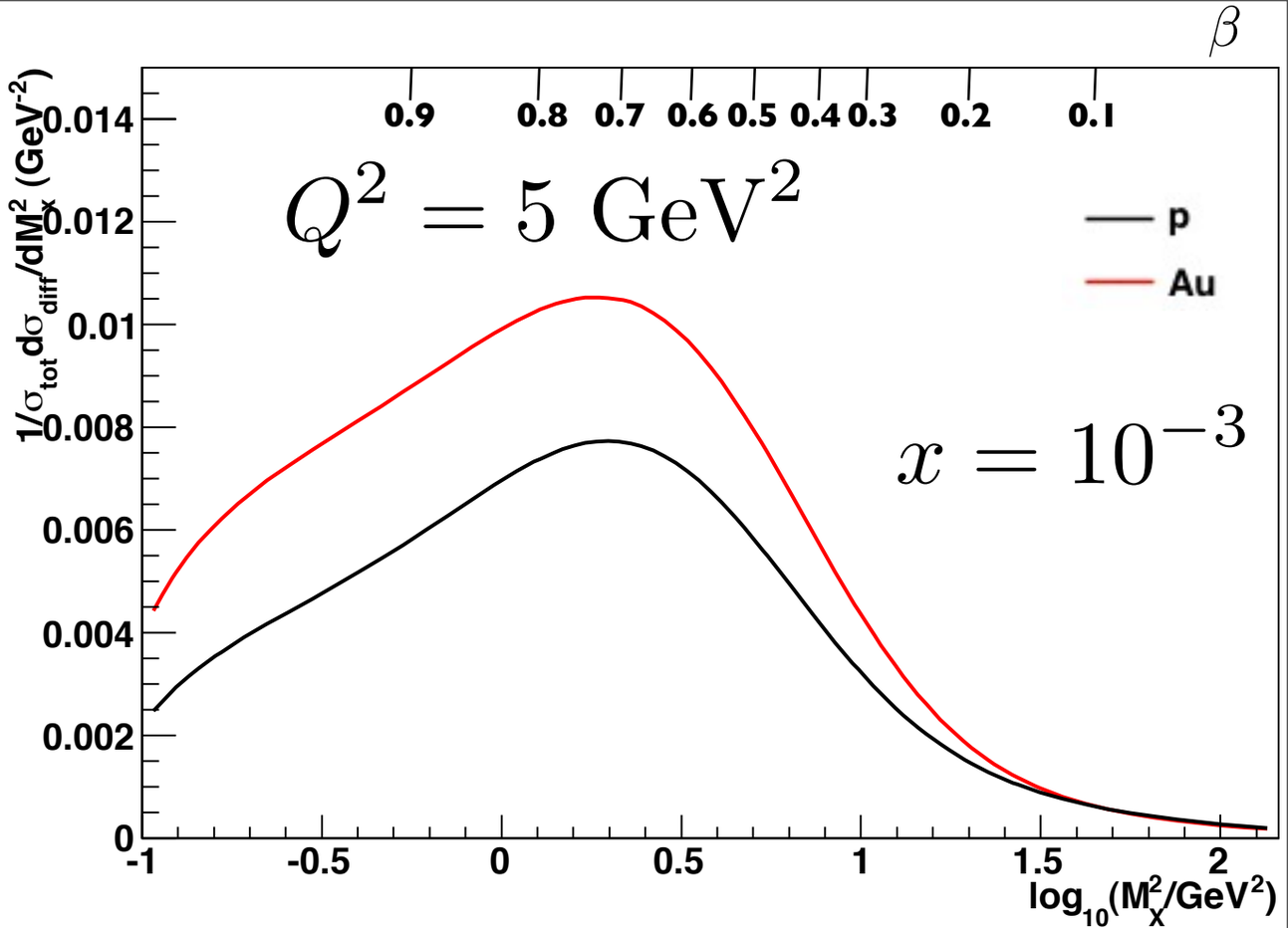
Saturation models say:

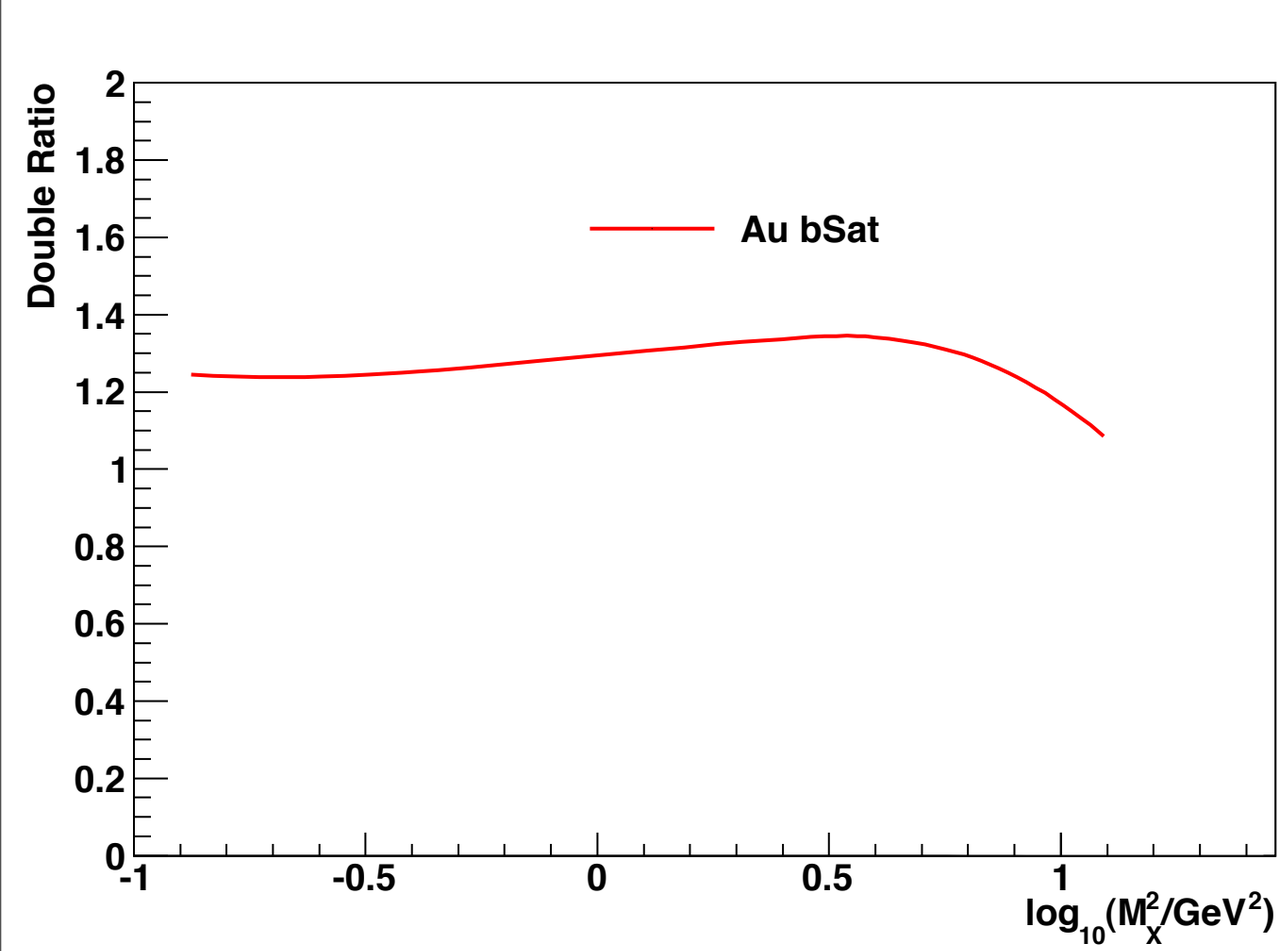
Away from saturation, there is more diffraction in *e*A than in ep

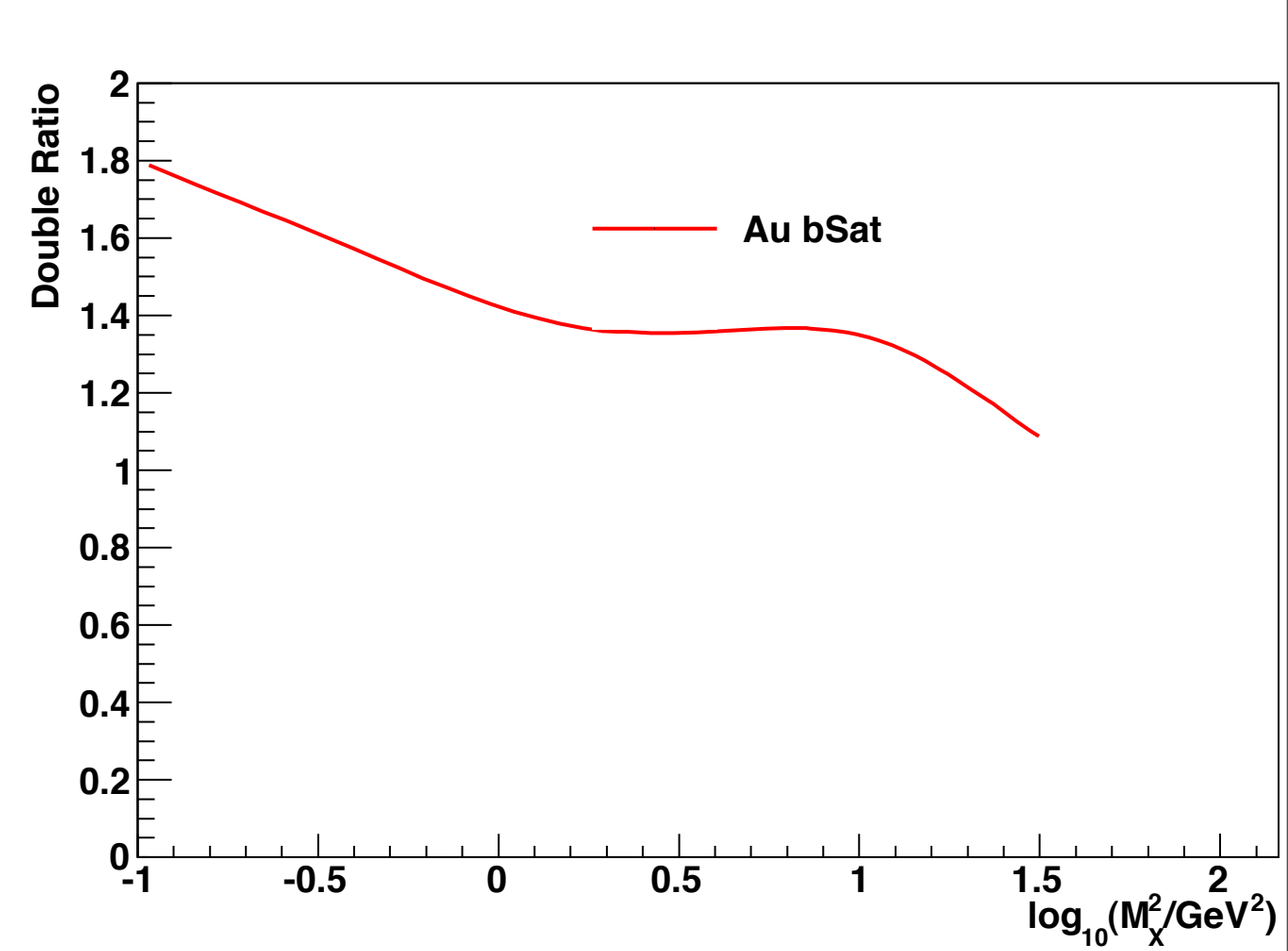
LTS is a **non-saturated model**, in the sense that there is a freedom how to choose the non-perturbative initial condition, as long as unitarity is upheld, but there is **no saturation** in evolution.

=> LTS predicts *R<1*.

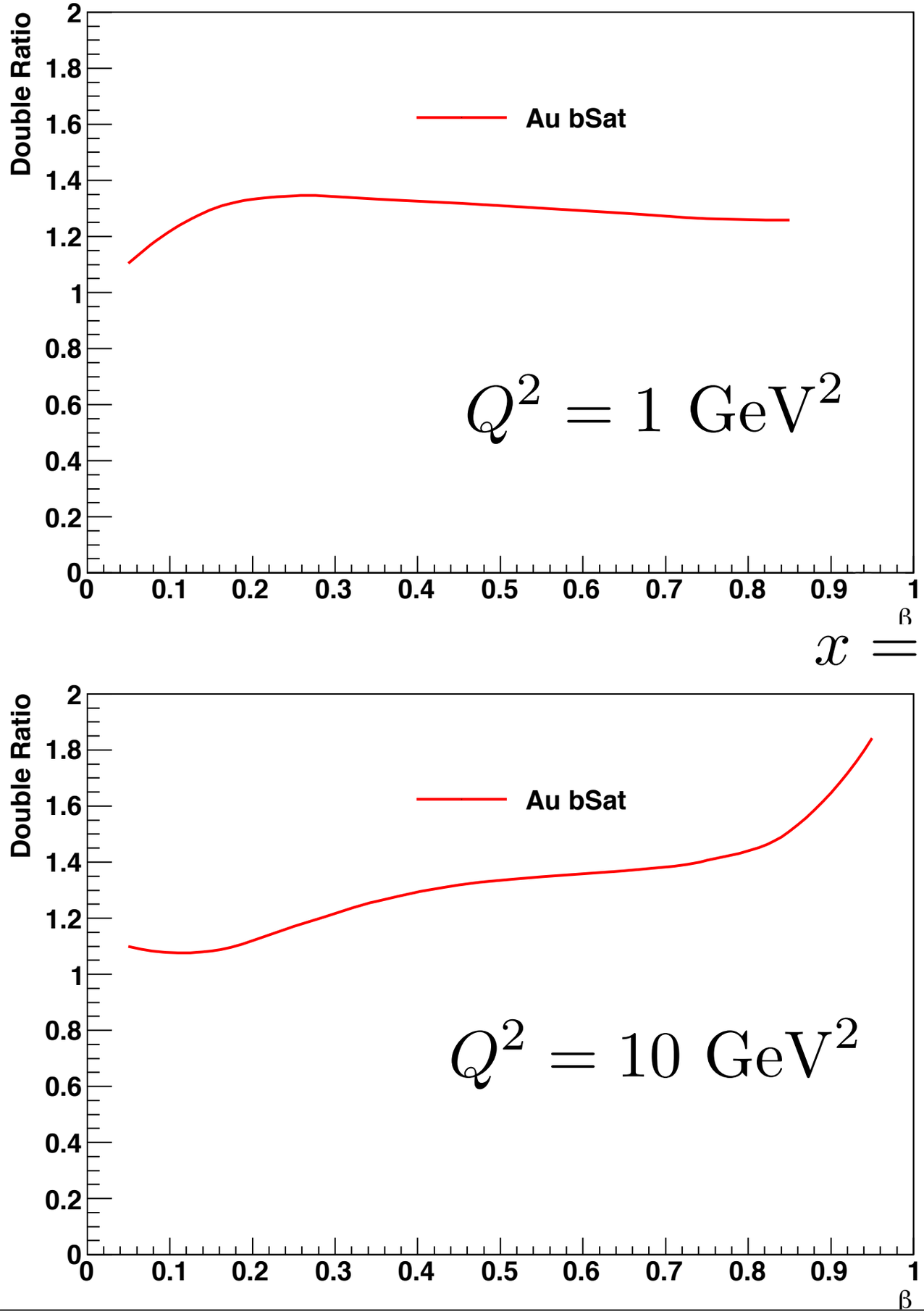

β
0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
$1/\sigma_{tot} d\sigma_{diff}/dM_X^2$ (GeV^{-2})
p
Au
$x = 10^{-3}$
$Q^2 = 1$ GeV^2
$\log_{10}(M_X^2/\text{GeV}^2)$


β
0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
$1/\sigma_{tot} d\sigma_{diff}/dM_X^2$ (GeV^{-2})
p
Au
$Q^2 = 5$ GeV^2
$x = 10^{-3}$
$\log_{10}(M_X^2/\text{GeV}^2)$

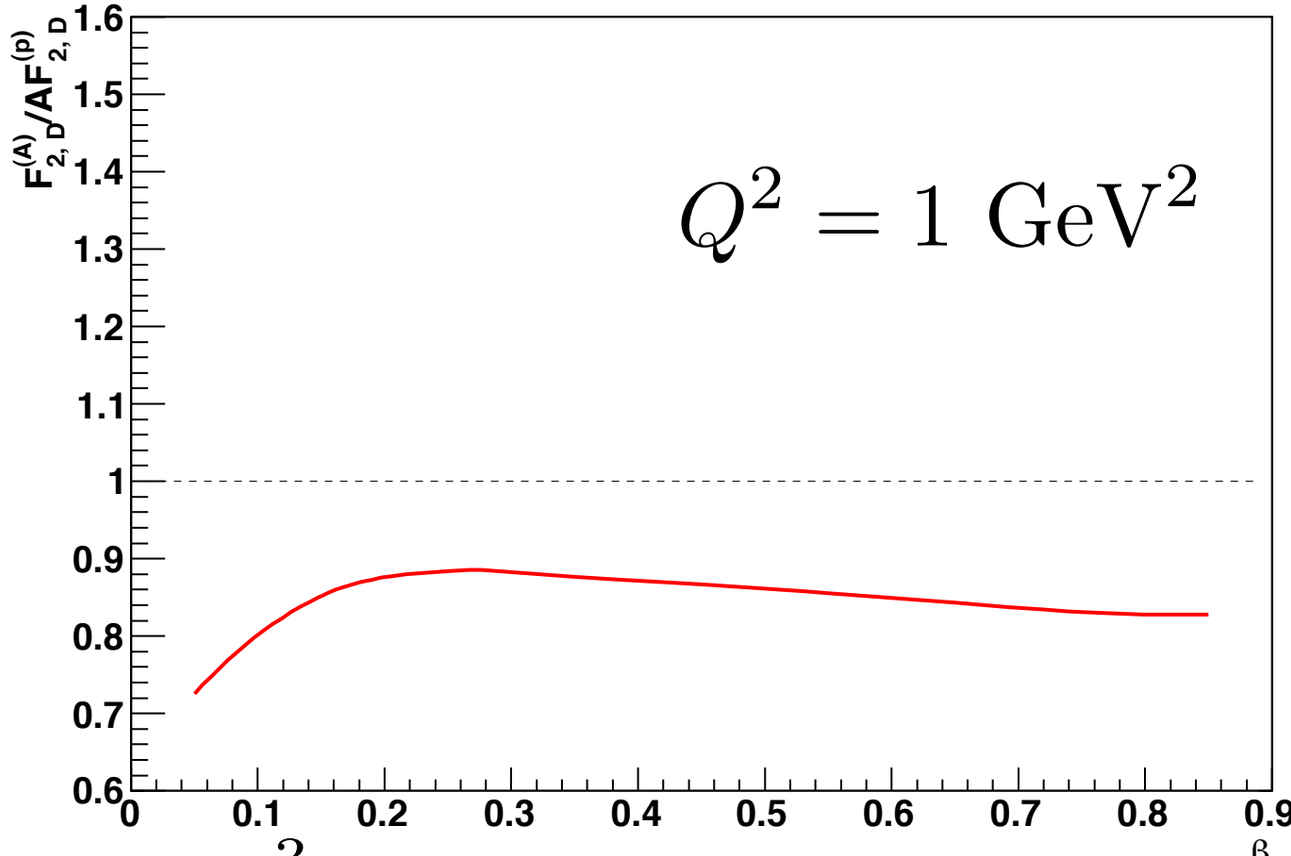

Double Ratio
Au bSat
$\log_{10}(M_X^2/\text{GeV}^2)$


Double Ratio
Au bSat
$\log_{10}(M_X^2/\text{GeV}^2)$

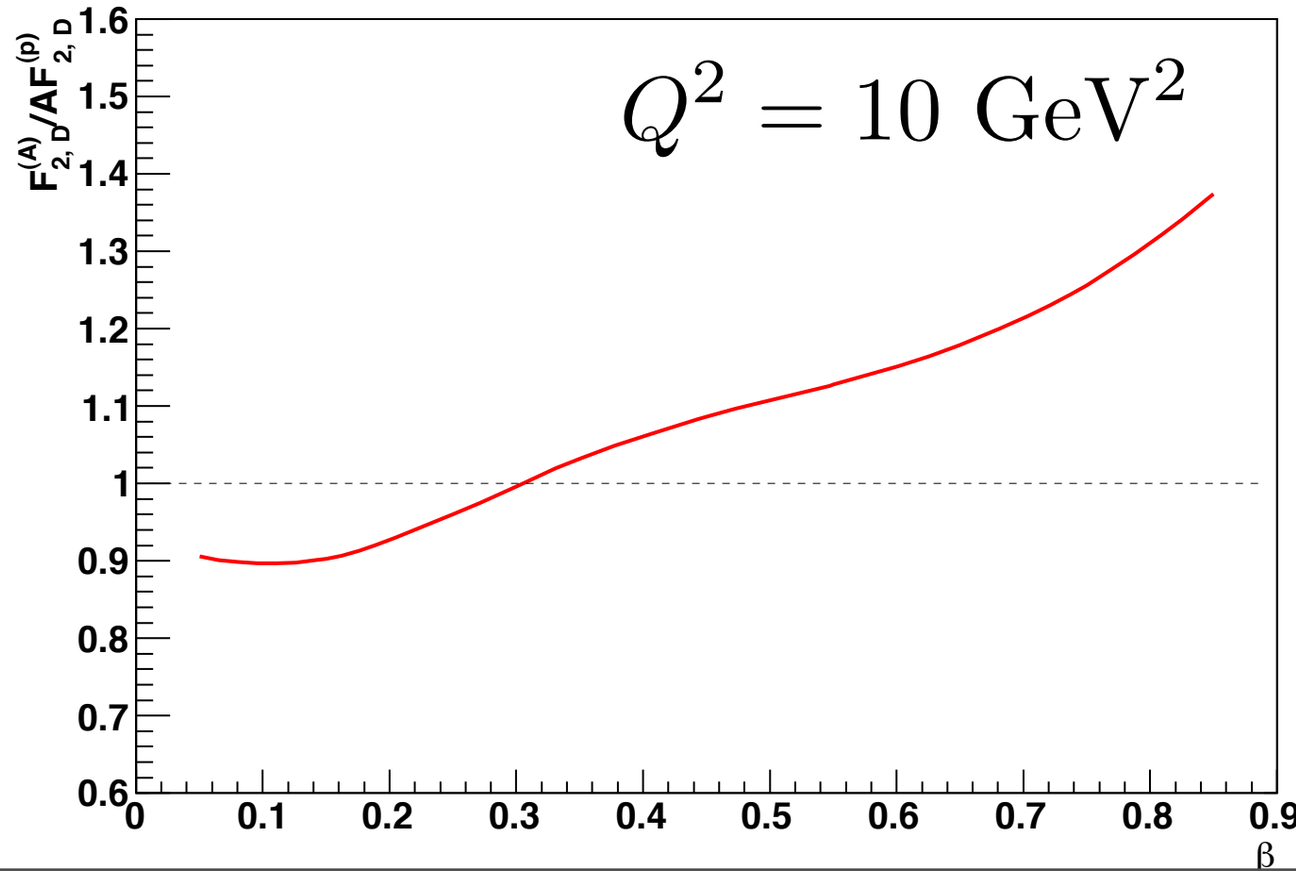
Double Ratio

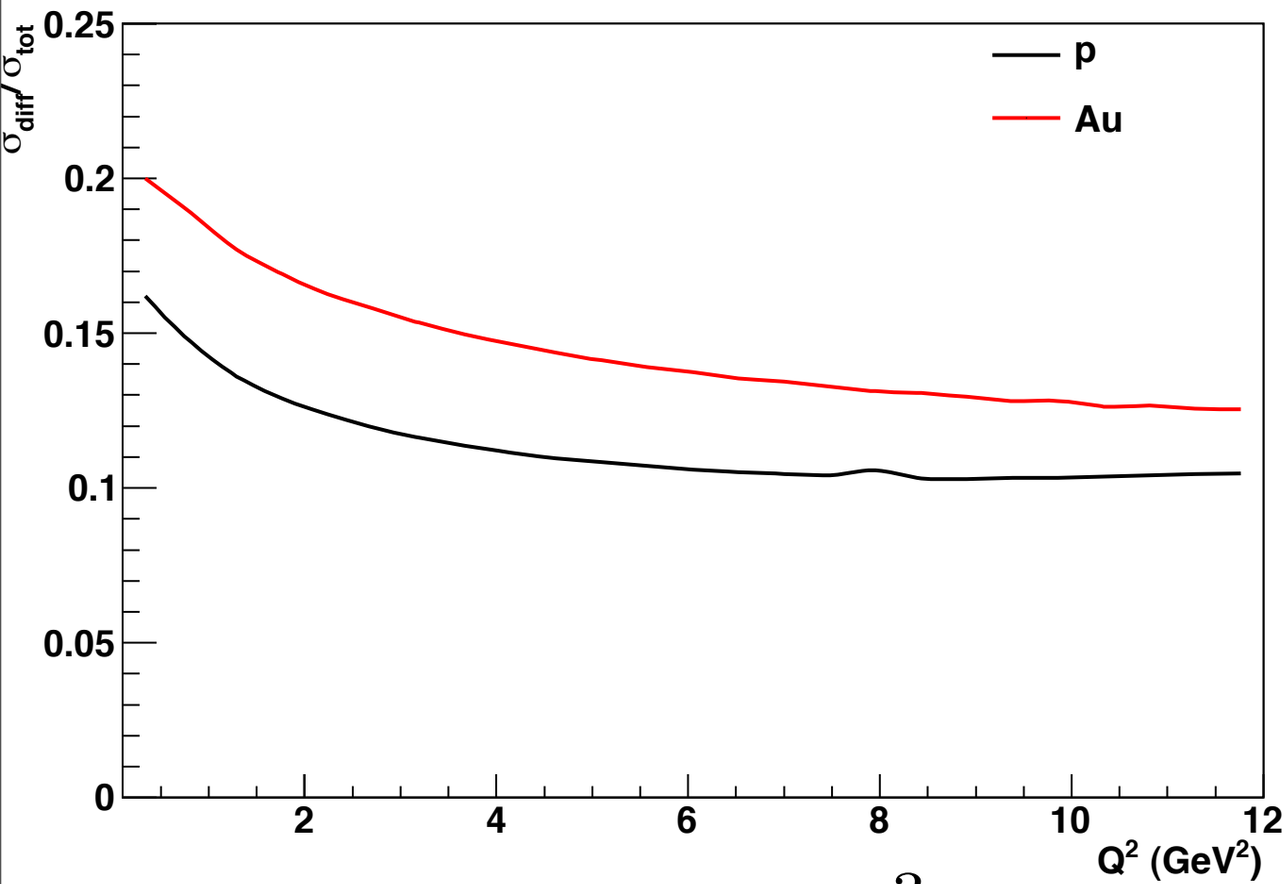


F_2-ratio

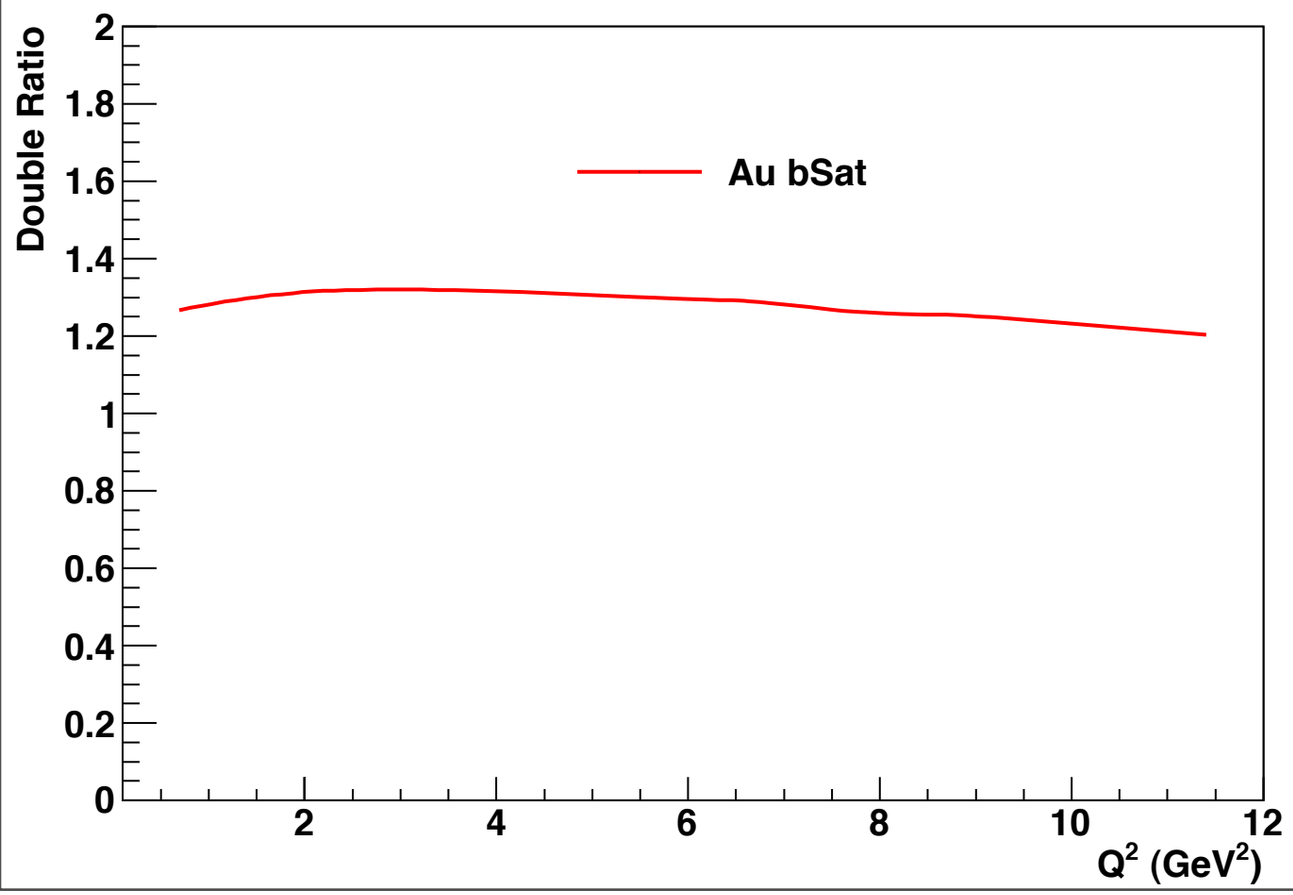


$$x = 2 \cdot 10^{-3}$$





$$x = 2 \cdot 10^{-3}$$



Diffractive cross-section integrated over M_X^2, such that:

$$M_X^2 > 2M_{\pi^0}^2$$
$$x_{I\!P} < 0.03$$

Large difference from LTS: